AMENDMENTS TO THE CLAIMS:

Cancel claims 26, 31, 32 and 33.

Add new claims 34, 35 and 36.

1. (CURRENTLY AMENDED) A photovoltaic cavity converter module for admitting therein concentrated radiation produced by a laser emitting a highly collimated power beam of coherent light having a selected wavelength and energy, and converting the admitted laser radiation at a high efficiency of about ~~65%~~ 60 to about 70% into electrical power, said module comprising:

(a) a housing having a cavity of generally optimized closed shape inside said housing, said cavity having a light input aperture or opening of a selected diameter with a total aperture area of A_i for the cavity, said aperture for ~~intercepting~~ admitting incident radiation thereon produced by the laser ~~and admitting the incident radiation~~ into the cavity, the cavity having a total internal surface area A_s and wherein the total aperture area of the opening being in a ratio of up to about 0.01 ~~or less~~ of the total internal surface area of the cavity, such that the aperture allows only a relatively small portion of the radiation admitted into the cavity to escape out of the cavity, thereby trapping in the cavity the incident radiation admitted therein in an amount proportional to the ratio of the total internal surface area to the total entrance aperture area to thereby define the total energy trapped in the cavity, the beam produced by the laser having a diameter greater than the aperture area;

(b) a concentrator exterior of the housing for intercepting and concentrating the laser radiation to a selected beam diameter smaller than the diameter of the aperture and for directing the radiation into the housing through the light input aperture to thereby capture the energy of the collimated laser beam; and

(c) a plurality of photovoltaic cells within said cavity, said photovoltaic cells having an appropriate energy bandgap maximally

responsive to said wavelength for generating ~~and to generate~~ said electrical power.

2. (ORIGINAL) The photovoltaic module of Claim 1 wherein each said photovoltaic cell is a single junction cell having a receiving surface on which said laser radiation is incident.

3. (ORIGINAL) The photovoltaic module of Claim 2 wherein each photovoltaic cell is provided with a back surface mirror for reflecting photons not absorbed by a photovoltaic cell on which said photons are incident.

4. (ORIGINAL) The photovoltaic module of Claim 2 wherein said photovoltaic cells have a given quantum efficiency selected to optimize the conversion of said wavelength of said laser.

5. (CURRENTLY AMENDED) The photovoltaic module of Claim 1 wherein the concentrator comprises a primary concentrator and a secondary concentrator, the primary concentrator further including a Cassegranian comprising a ~~primary concentrator of~~ parabolic concentrator ~~shape~~ for prefocusing the laser radiation, and a hyperbolic ~~secondary~~ concentrator ~~of hyperbolic shape~~ for receiving pre-focused laser radiation from the parabolic ~~a primary~~ concentrator and directing the beam into said opening.

6. (CURRENTLY AMENDED) The photovoltaic module of Claim 5 wherein said ~~primary and secondary concentrators include inner and outer surfaces that are~~ secondary concentrator has a mirrored inner surface.

7. (PREVIOUSLY PRESENTED) The photovoltaic module of Claim 6 wherein said secondary concentrator is a non-imaging, compound parabolic of hollow design.

8. (CURRENTLY AMENDED) The photovoltaic module of Claim 6 wherein said secondary concentrator has a Bezier optimized contour to provide a combination of ~~an optimal~~ maximum acceptance angle~~,~~ at ~~and~~ optimal concentration, and ~~minimal~~ minimum height.

(ORIGINAL)

9. (PREVIOUSLY PRESENTED)The photovoltaic module of Claim 5 wherein said secondary concentrator is dielectric and further includes an integral extractor rod for guiding said light towards the center of said cavity and then to emit photons near uniformly in all directions to provide good angular isotropy of said photons.

10. (CURRENTLY AMENDED) The photovoltaic module of Claim 1 wherein the energy of the beam in coherent form enters the sphere where said energy scatters such that the probability of escape through the aperture is reduced in accordance with the ratio, and wherein the overall concentration of the module is at least 20 ~~of A_c to A_s is 0.01 or less~~.

11. (PREVIOUSLY PRESENTED) The photovoltaic module of Claim 1 wherein said photovoltaic cells have an optimized energy bandgap to respond to said wavelength.

12. (ORIGINAL) The photovoltaic module of Claim 11 wherein said photovoltaic cells have a peak of quantum efficiency response matching said wavelength.

13. (CURRENTLY AMENDED) The photovoltaic module of Claim 1 ~~wherein the laser radiation contains a power component of a selected~~

~~wavelength and a multiplexed or imbedded communications component of a different wavelength, and further including~~ wherein

(a) ~~a~~ at least some of the plurality of photo voltaic cells ~~and fast photon detectors~~ within said cavity, ~~at least some of said cells each having~~ have different ~~an~~ energy ~~bandgap~~ bandgaps ~~corresponding to the power component of the laser radiation, and at least some of said fast photon detectors having an energy bandgap corresponding to the communications component of the multiplexed laser radiation,~~ so that their spectral responses span different wavelength ranges; and

(b) at least one wavelength filter associated with each photo voltaic cell, ~~and another wavelength filter associated with each fast photon detector~~ said wavelength filter comprising at least one of a Rugate filter ~~filters~~ and stack interference filters, providing selective transmission and reflection of incident radiation~~corresponding to the respective energy bandgaps of the cells and the fast photon detectors and reflection of incident radiation respectively to demultiplex the components and to assist in maximizing absorption of each component of the laser radiation by the cells and by the fast photon detectors having corresponding energy bandgaps~~.

14. (CURRENTLY AMENDED) The photovoltaic module of Claim 13 wherein said photo voltaic ~~solar~~ cells are multi-junction cells ~~solar cells to allow frequency or color change in the power component of the multiplexed beam~~.

15. (CURRENTLY AMENDED) In combination, a photovoltaic module and a ~~reflecting~~ concentrator system external of the ~~and a~~ photovoltaic module for admitting therein coherent radiation produced by a laser emitting coherent light at a selected wavelength and initial diameter, and converting the admitted radiation into electrical power, wherein:

(a) said module comprises:

(1) a housing having a cavity of generally optimized closed shape inside said housing, said cavity having a total internal surface area A_s and including an opening having a selected diameter smaller than the diameter of the light ~~laser radiation~~, and having a total aperture area A_i for admitting said light ~~laser radiation~~ into said cavity, said opening having an entrance aperture area A_i of in a ratio of up to about 0.01 ~~or less~~ of the total internal surface area of the cavity, such that the aperture allows only a relatively small portion of the light ~~radiation~~ admitted into the cavity to escape out of the cavity, thereby trapping in the cavity the light ~~radiation~~ admitted therein in an amount proportional to the ratio of the total internals surface area to the entrance aperture area~~l~~, the initial diameter of the light being greater than the diameter of the opening;

(2) a plurality of photovoltaic cells within said cavity, said photovoltaic cells having selected appropriate bandgap energy responsive to said wavelength to generate said electrical power;

(b) said reflecting concentrator comprises:

(1) a primary concentrator for intercepting and concentrating said light ~~laser radiation~~ from the selected diameter to a diameter smaller that the initial diameter , and

(2) a secondary concentrator coupled to the for receiving said concentrated light ~~laser radiation~~ from the primary concentrator and further concentrating said light ~~laser radiation~~ from said primary concentrator to a diameter less than the diameter of the aperture and injecting the light into the housing through the aperture; and

~~(c) said photovoltaic module positioned for receiving said further concentrated laser radiation from said secondary concentrator~~.

16. (CURRENTLY AMENDED) The combination of Claim 15 wherein said ~~reflecting~~ concentrator comprises a reflecting Cassegranian concentrator.

17. (CURRENTLY AMENDED) The combination of Claim 16 ~~15~~ wherein said Cassegranian concentrator comprises ~~as said primary concentrator~~ a parabolic concentrator and ~~as said secondary concentrator~~ a hyperbolic concentrator.

18. (ORIGINAL) The combination of Claim 15 wherein each said photovoltaic cell is a single junction cell having a receiving surface on which said laser radiation is incident.

19. (ORIGINAL) The combination of Claim 18 wherein each photovoltaic cell is provided with a back surface mirror for reflecting photons not absorbed by a photovoltaic cell on which said photons are incident.

20. (ORIGINAL) The combination of Claim 18 wherein said photovoltaic cells have a given quantum efficiency selected to optimize the conversion of said wavelength of said laser.

21. (CURRENTLY AMEDED) The combination of Claim 15 ~~further including a secondary concentrator system for receiving pre-focused said laser radiation from a primary concentrator, secured to said opening~~ wherein the energy of the beam in coherent form enters the cavity where said energy scatters such that the probability of escape through the aperture is reduced in accordance with the ratio, and wherein the overall concentration of the combination is at least 20.

22. (CURRENTLY AMENDED) The combination of Claim ~~21~~ 15 wherein said secondary concentrator includes inner surfaces that are mirrored.

23. (ORIGINAL) The combination of Claim 22 wherein said secondary concentrator is a non-imaging, compound parabolic of hollow design.

24. (PREVIOUSLY PRESENTED) The combination of Claim 22 wherein said secondary concentrator has a Bezier optimized contour to provide a combination of maximal acceptance angle, maximal concentration, and minimal height.

25. (CURRENTLY AMENDED) The combination of Claim 21 wherein said secondary concentrator is dielectric and further includes an integral extractor rod extending into the housing for guiding said light towards the center of said cavity and ~~then~~ to emit photons near uniformly in all directions to provide good angular isotropy of said photons.

26. (CANCELLED) ~~The combination of Claim 15 wherein the ratio of A_r to A_s is 0.01 or less.~~

27. (ORIGINAL) The combination of Claim 15 wherein said photovoltaic cells have an optimized energy bandgap to respond to said wavelength.

28. (ORIGINAL) The combination of Claim 27 wherein said photovoltaic cells have a peak of quantum efficiency response matching said wavelength.

29. (ORIGINAL) The combination of Claim 15 further including means for transferring waste heat from said photovoltaic module to a back surface of said primary concentrator for radiation into the surrounding environment.

30. (CURRENTLY AMENDED) The combination of Claim 15 further including

(a) a plurality of photo voltaic cells within said cavity, at least some of said cells each having different energy bandgaps so that their spectral responses span a least a portion of the spectrum of the incident radiation; and

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(b) at least one wavelength filter associated with each cell, said at least one wavelength filter comprising Rugate filters and a combination of Rugate filters and stack interference filters, thereby providing selective transmission or reflection of incident radiation ~~wherein said coherent radiation includes at least two multiplexed wavelengths of radiation, a first wavelength corresponding power component and a second corresponding to communications component, at least some of said photovoltaic cells have an energy bandgap maximally responsive to the power component of the multiplexed radiation and the fast photon detectors have have an energy bandgap maximally responsive to the communications component such that the power component and the communications component are de-multiplexed.~~.

31. (CANCELLED) ~~The combination of Claim 30 wherein said cells and fast photon detectors are tuned to a frequencies corresponding to the power component or the communications component of the multiplexed laser beam.~~

32. (CANCELLED) ~~The combination of claim 30 further comprising:~~

~~at least one wavelength selective filter associated with each corresponding photovoltaic cell, said filter associated with the cells responsive to the power component for filtering the communications component from the multiplexed wavelengths, and the filter associated with the fast photon detectors responsive to the communications component for filtering the power component from the multiplexed wavelengths, such that cells responsive to the power component produce an electrical power output and fast photon detectors responsive to the communications component produce a communications output.~~

33. (CANCELLED) ~~The combination of claim 32 wherein each filter comprises a Rugate filter, for reflecting one of the components of the multiplexed wavelengths, such that only wavelengths are transmitted to each cell and to each fast photon detector for which the cell and each fast photon detector is responsive for producing the corresponding output.~~

34. (New) A photovoltaic cavity converter module for admitting therein radiation produced by a laser emitting a power beam in the form highly collimated coherent light having a selected energy, wavelength and relatively large diameter, and converting the admitted radiation at a high efficiency of at least 60% into electrical power, said module comprising:

a housing having a cavity of generally optimized closed shape inside said housing and having a total internal surface area A_s, said cavity having a light input aperture of a selected diameter smaller than the relatively large diameter of the beam for admitting said beam, the aperture having a total aperture area of A_i for the cavity;

a concentrator external of the housing for intercepting the laser and reducing the diameter of the beam to a diameter smaller than the aperture for concentrating the laser radiation and for directing the

energy of the light contained in the relatively large diameter power beam produced by the laser into the small diameter of the aperture;

the total aperture area of the aperture being in a ratio of up to about 0.01 of the total internal surface area of the cavity, such that the aperture allows only a relatively small portion of the light admitted into the cavity to escape out of the cavity, thereby trapping in the cavity the light admitted therein in an amount proportional to the ratio of the total internal surface area to the total entrance aperture area to thereby define the total energy trapped in the cavity; and

a plurality of photovoltaic cells within said cavity, said photovoltaic cells having an appropriate energy bandgap maximally responsive to the wavelength of the light for generating said electrical power; and

wherein the cavity converter module exhibits an overall concentration of at least 20.

35. (New) The photovoltaic cavity converter module of claim 34 wherein the concentrator comprises a first concentrator stage for intercepting and reducing the diameter of the beam to a first smaller diameter, and a second concentrator stage coupled to the aperture for intercepting the beam of smaller diameter and further reducing the diameter to less than the diameter of the aperture and for injecting the light into the housing.

36. (New) The photovoltaic cavity converter module of claim 34 wherein the second concentrator stage further includes an extractor located within the cavity for distributing the light inside the cavity such that the energy of the beam in coherent form enters the cavity where said energy scatters such that the probability of escape through the aperture is reduced in accordance with the ratio.

37. (New) The photovoltaic cavity converter module of claim 35 wherein the extractor comprises a rod extending from the aperture to the center of the housing for guiding the light towards the center of the cavity and for emitting the light substantially uniformly in all directions within the cavity.